

* NOTICES *

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MEANS

[Means for Solving the Problem] In order to solve the above-mentioned technical problem invention according to claim 1 It is the dresser washing approach of the polish equipment which washes the dressing side adjacent to this polished surface of the dresser which does the dressing of the polished surface of polish equipment. A dresser's dressing side is immersed into liquid, or a dressing side is contacted in liquid. It is characterized by injecting the liquid flow accompanied by cavitation to this dressing side in this condition, or exciting this liquid by supersonic vibration, or generating detailed air bubbles in this liquid, and making a dressing side contact, or washing this dressing side or more [these] combining two.

[0006] By injecting the liquid flow accompanied by cavitation to a dresser's dressing side as mentioned above, the blinding by shaving, **, or this shaving or ** adhering to a dressing side is efficiently removable with the impulse wave energy generated when this cavitation breaks. Moreover, the liquid oscillation by supersonic vibration can remove efficiently the blinding by shaving, **, or this shaving or ** that adhered to a dresser's dressing side with propagation and its vibrational energy in the dressing side by exciting liquid by supersonic vibration. Moreover, the blinding by shaving, **, or this shaving or ** that adhered to the dressing side with energy in case these air bubbles are torn is efficiently removable by making detailed air bubbles contact a dressing side. Moreover, the blinding by shaving, **, or this shaving or ** that adhered to the dressing side more efficiently is removable by combining these two or more with the synergistic effect.

[0007] Moreover, while according to invention according to claim 2 being the dresser washing station of the polish equipment which washes the dressing side adjacent to this polished surface of the dresser which does the dressing of the polished surface of polish equipment and forming the cistern which holds liquid A liquid flow injection means to inject the liquid flow accompanied by cavitation to the dressing side where the liquid of this cistern is contacted in a dresser. Or it is characterized by preparing any 1 of a supersonic vibration means to add an oscillation of a supersonic wave to the liquid of a cistern, or the gassing means which are made to diffuse air bubbles in the liquid of a cistern, and are made to contact a dressing side, or 2 or more.

[0008] According to the washing station of the above-mentioned configuration, since any 1 of a liquid flow injection means or a supersonic vibration means, and the gassing means or 2 or more were prepared as mentioned above, shaving, **, and blinding of a dressing side are efficiently removable with the same operation as the above-mentioned washing approach.

[0009]

[Embodiment of the Invention] Hereafter, the example of a gestalt of operation of this invention is explained based on a drawing. Drawing 1 is drawing showing the outline configuration of the polish equipment possessing the dresser washing station concerning this invention. This polish equipment possesses a turntable 1 and the abrasive cloth 2 which constitutes a polished surface is stuck on the top face of this turntable 1. 3 is a top ring holding the ground substrates W, such as a semi-conductor wafer, and this top ring 3 is attached can rotate freely on the top ring head 4, and free [vertical movement]. Moreover, it can be circled now in the top ring head 4 through a fixed pivot 5, and it can move a top ring 3 now to the polish location of the upper part of a turntable 1, and the position in readiness (evacuation location) of the outside of a turntable 1 by this turning.

[0010] 6 is a dresser which does the dressing of the polished surface of abrasive cloth 2, and this dresser 6 is attached in the dresser head 7 free [a revolution and vertical movement]. It can be circled now in the dresser head 7 through a fixed pivot 8, and it can move a dresser 6 now to the dressing location of the upper part of a turntable 1, and the position in readiness (evacuation location) of the outside of a turntable 1 by this turning.

[0011] The cistern 9 which holds a penetrant remover 10 (mainly pure water) in the above-mentioned dresser's 6 position in readiness is arranged, and the dresser 6 is immersed into the penetrant remover 10 of this cistern 9 during standby in the dressing side (field which contacts into a dressing in the polished surface of abrasive cloth 2). Two or more blowout nozzles 11 which spout the penetrant remover style (mainly pure water) accompanied by cavitation toward a dresser's 6 dressing side are arranged at the pars basilaris ossis occipitalis of a cistern 9.

[0012] In the polish equipment of the above-mentioned configuration, the front face of the ground substrate W is ground to flatness and a mirror plane by the relative motion of the ground substrate W and abrasive cloth 2 by holding the ground substrate W with a top ring 3, supplying an abrasive liquid on this polished surface from the abrasive liquid supply nozzle which does not press and illustrate this ground substrate W by the predetermined pressure on the polished surface of abrasive cloth 2, and rotating a turntable 1 and a top ring 3. In this polish process, abrasive cloth 2 gets that slot or micropore blocked by the slurry in an abrasive liquid, polish, or **, or change (glazing) of (blinding) and the shape of surface type of a slot itself and configuration change (field sagging) of a polished surface arise. For this reason, the dressing process which uses a dresser and carries out the dressing of the polished surface next is performed. However, a dresser's dressing side itself may start blinding.

[0013] Then, it is necessary to adhere and delete to a dresser's 6 dressing side, to remove **** and blinding, and to aim at recovery of dressing capacity. Here, while it was immersed into the penetrant remover 10 of the cistern 9 arranged on the outside of a turntable 1 and the dresser 6 was standing by, the penetrant remover style by which cavitation is accompanied toward a dresser's 6 dressing side from the blowout nozzle 11 was spouted, and impulse wave energy in case this cavitation breaks has removed efficiently the blinding by shaving, **, or this shaving or ** of a dressing side.

[0014] Drawing 2 is drawing showing the example of a configuration of the above-mentioned blowout nozzle 11. The blowout nozzle 11 is the configuration that provided the nozzle body 11-1, the converging section 11-3 was formed in this nozzle body 11-1 succeeding the inner hole 11-2, and sudden expansion voluminousness 11-4 were formed in the downstream of a converging section 11-3 so that it may illustrate. This blowout nozzle 11 projects at the pars basilaris ossis occipitalis of a cistern 9, and is arranged at it.

[0015] In the blowout nozzle 11 of the above-mentioned configuration, if a high-pressure penetrant remover is supplied to this inner hole 11-2, this penetrant remover will serve as the high-speed penetrant remover jet J through a converging section 11-3, and will be injected toward a dresser's 6 dressing side 6a. Induction of the penetrant remover 10 of the exterior of the blowout nozzle 11 is carried out to the flow of the high-speed penetrant remover jet J, a part of penetrant remover 10 flows backwards to sudden expansion voluminousness 11-4, circulating flow S occurs, and a very complicated and remarkable rate shear layer is generated between this circulating flow S and the high-speed penetrant remover jet J.

[0016] And many detailed eddies occur in this shear layer, very many cavitation nuclei generate at the core of those eddies, it becomes the cavitation jet CJ which flowed into the downstream and fully progressed with the high-speed penetrant remover jet J, and a dresser's 6 dressing side 6a is contacted. And shaving or ** adhering to dressing side 6a, and blinding are removed by impulse wave energy in case cavitation breaks. At this time, dressing side 6a is washed by homogeneity from rotating a dresser 6 at a low speed.

[0017] In addition, the nozzle which spouts the liquid flow accompanied by the above-mentioned cavitation is not limited to the thing of a configuration of being shown in drawing 2, and should just generate the liquid flow accompanied by cavitation.

[0018] Drawing 3 is drawing showing the example which has arranged ultrasonic rocking equipment at the pars basilaris ossis occipitalis of a cistern. Ultrasonic rocking equipment 12 is formed in the pars basilaris ossis occipitalis of a cistern 9, a dresser's 6 dressing side 6a is immersed into the penetrant remover 10 of this cistern 9, and an oscillation of a supersonic wave is added to a penetrant remover 10 in this condition so that it may illustrate. Thereby, the penetrant remover oscillation 13 by this supersonic vibration spreads to dressing side 6a, and the blinding by shaving, **, or this shaving or ** that adhered to dressing side 6a with that vibrational energy is removed efficiently. Under the present circumstances, dressing side 6a is washed by homogeneity by rotating a dresser 6 at a low speed.

[0019] Drawing 4 is drawing showing the example which has arranged the cellular generator at the pars basilaris ossis occipitalis of a cistern. Many detailed air bubbles 15 of the air and the nitrogen gas which occurred from this cellular generator 14 diffuse in a penetrant remover 10 by arranging the cellular generator 14 which generates air bubbles, such as air (Air) and nitrogen (N₂) gas, at the pars basilaris ossis occipitalis of a cistern 9, and supplying air and nitrogen gas to this cellular generator 14 so that it may illustrate. And the blinding by shaving, **, or this shaving or ** that adhered to dressing side 6a with the energy when air bubbles 15 going up and being torn in contact with a dresser's 6 dressing side 6a is removed efficiently. Under the present circumstances, dressing side 6a is washed by homogeneity by rotating a dresser 6.

[0020] These [two or more] may be combined, and although the example which formed independently the blowout nozzle 11 which spouts the liquid flow accompanied by cavitation, the ultrasonic rocking equipment 12 which generates an ultrasonic oscillatory wave, and the cellular generator 14 which generates air bubbles in the cistern 9, respectively was shown, the synergistic effect may constitute from the above-mentioned example so that the capacity to remove shaving, **, and blinding of dressing side 6a may be raised.

[0021] In addition, although the above-mentioned example showed the example which stuck abrasive cloth 2 on the top face of a turntable 1 as polish equipment, the configuration of having stuck the grinding stone on the top face of a turntable 1 may be used. Moreover, if it is polish equipment of a

configuration of grinding a substrate by the relative motion of the substrate which are a polished surface and a polish object, the dresser washing approach and equipment of this invention are applicable.

[Translation done.]